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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,840	12/05/2001	Eiji Kasutani	15139	7737
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SCULLY SCOTT MURPHY & PRESSER, PC 400 GARDEN CITY PLAZA GARDEN CITY, NY 11530			HUNG, YUBIN	
			ART UNIT	PAPER NUMBER
			2625	

DATE MAILED: 11/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/010,840

Applicant(s)

KASUTANI, EIJI

Examiner

Yubin Hung

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-43 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date All 4 thru 7/30/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 21 February 2002 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Specifically, the ISO publication listed in the IDS is shown as "...WG11 N3521."

However, the submitted copy is shown as "...WG11/W3522." The submitted copy has been considered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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4. Claim 1, and similarly claims 21 and 34, recites the limitation "the image in question" in (lines 10-11 of claim 1). There is insufficient antecedent basis for this limitation in the claim. Claims 2-20, 22-33, 35-43 are similarly rejected due to dependency. **[Note: For examination purpose "the image in question" will be interpreted as "the target image."]**

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2, 14-16, 21, 22, 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiiyama (US 6,584,223), in view of Matsuzaki et al. (US 6,804,683).

7. Regarding claim 21, and similarly claims 1 and 34 Shiiyama discloses an image search method with the following limitations

- The images' features are represented by either color distribution features or frequency distribution features [Fig. 4: refs. S12-S14; Col. 5, lines 1-64. Note that the label sequence referred to in Col. 5, lines 63-64 is the color distribution feature of the image]
- Comparing the image features amount of said inquiry image with the image features amount of each said image to be searched based on said

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converted image features amount and determining a similarity of each image to search for a similar image
[Fig. 2, ref. 16; Col. 4, lines 47-51]

Shiiyama does not expressly disclose that

- Converting the kind of image features amount of the image in question to make kinds of image features amounts of each said image to be searched and said inquiry image coincident with each other

However, Matsuzaki teaches feature conversion [Col. 20, line 28-65. Note that here for each of a set of images its features are represented in different coordinate system (each constituting a different "kind" of features) and need to be converted into a common kind (e.g., the 3-D standard model coordinates) in order to carry out feature comparison. Note further that the conversion results in all images in question having the same kind of features.]

Shiiyama and Matsuzaki are combinable because they have aspects that are from the same field of endeavor of image retrieval.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Shiiyama with the teachings of Matsuzaki by including the feature conversion capability. The motivation would have been to make the image search/retrieval method more flexible because it is well known in the art that many kinds of features are in use as a descriptor of images (see, for example, pp. 1-3 of the application) and similarity comparison has to be made on a common basis (so as not to, say, compare apples with

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oranges). Furthermore, converting from one kind of feature directly into another can be more efficient than to compute the feature from an input image.

Therefore, it would have been obvious to combine Matsuzaki with Shiiyama to obtain the invention as specified in claim 21.

8. Regarding claims 14 and 15, Matsuzaki further suggests

- (claim 14) each said image to be searched is set to be a target whose kind of said image features amount is to be converted, and the kind of image features amount of each said image to be searched is converted to be coincident the kind of image features amount of said inquiry image and
(claim 15) said inquiry image is set to be a target whose kind of said image features amount is to be converted, and the kind of image features amount of said inquiry image is converted to be coincident with the kind of image features amount of each said image to be searched
[Col. 20, lines 50-65. Note that as the features have to be of the same kind (e.g., features in the standard model coordinates) for a similarity calculation to be carried out, it is obvious that if for example the reference (i.e., inquiry) image has features in the standard model coordinates then each of the images in the database (i.e., images to be searched) should be set as a target and its features converted so as to be coincident with that of the reference image. The same is true if instead each image to be searched has features in the standard model coordinates.]

9. Regarding claim 16, Matsuzaki further discloses

- both the images, said inquiry image and said image to be searched, are set to be a target whose kind of said image features amount is to be converted, and the kinds of image features of the respective searched, are converted
[Col. 20, lines 50-65. Note that the kinds of features of all images in question are (selected as targets and) converted]

10. Regarding claim 22, and similarly claims 2 and 35, Shiiyama further discloses

- Referring to data of the image features amount of each said image to be searched, and receiving input of data of the image features amount of said inquiry image

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[Fig. 9, refs. S21-S22 (feature amount of the inquiry image), S23 (feature amount of images to be searched)]

11. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiiyama (US 6,584,223) and Matsuzaki et al. (US 6,804,683) as applied to claims 1, 2, 14-16, 21, 22, 34 and 35 above, in view of Setlak (US 5,852,670).

12. Regarding claim 17, the combined invention of Shiiyama and Matsuzaki discloses all limitations of its parent, claim 16.

The combined invention of Shiiyama and Matsuzaki does not expressly disclose

- a circuit for converting a kind of image features amount of said inquiry image and a circuit for converting a kind of image features amount of each said image to be searched are provided independently

However, Setlak teaches using multiple processors to perform the same task, namely feature extraction. [Fig. 18, ref. 92; Col. 9, lines 43-46.]

Shiiyama, Matsuzaki and Setlak are combinable because they have aspects that are from the same field of endeavor of feature extraction.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Shiiyama and Matsuzaki with the teachings of Setlak by using multiple processors to perform task of converting features. The motivation would have been to

improve the processing speed, especially for applications for which a short response time is critical.

Therefore, it would have been obvious to combine Setlak with Shiiyama and Matsuzaki to obtain the invention as specified in claim 17.

13. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiiyama (US 6,584,223) and Matsuzaki et al. (US 6,804,683) as applied to claims 1, 2, 14-16, 21, 22, 34 and 35 above, in view of Nakagawa et al. (US 6,104,434).

14. Regarding claims 19 and 20, the combined invention of Shiiyama and Matsuzaki discloses all limitations of its parent, claim 1.

The combined invention of Shiiyama and Matsuzaki does not expressly disclose

- (claims 19 & 20) said frequency distribution features is set to be an image features amount generated by converting an image as an object representing feature into a reduced image of a fixed size and subjecting said reduced image to frequency transformation
- (claim 20) and quantization

However, Nakagawa teaches generating frequency distribution features (i.e., DCT coefficients) by first down sampling, followed by DCT and then quantization. [See Fig. 3: refs. 26a, 27a, 27b.]

Shiiyama, Matsuzaki and Nakagawa are combinable because they have aspects that are from the same field of endeavor of feature extraction.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Shiiyama and Matsuzaki with the teachings of Nakagawa to generate frequency distribution features (i.e., DCT coefficients) by first down-sampling, followed by DCT and then quantization.. The motivation would have been to reduce data size to facilitate efficient data storage and transmission..

Therefore, it would have been obvious to combine Nakagawa with Shiiyama and Matsuzaki to obtain the inventions as specified in claims 19 and 20.

15. Claims 3, 4, 11, 12, 23, 24, 31, 32, 36, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiiyama (US 6,584,223) and Matsuzaki et al. (US 6,804,683) as applied to claims 1, 2, 14-16, 21, 22, 34 and 35 above, and further in view of Kusama et al. (US 6,633,685).

16. Regarding claim 23, and similarly claims 3 and 36, the combined invention of Shiiyama and Matsuzaki discloses

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- A features conversion step of converting a (*certain set of*) features into color distribution features indicative of feature similar to image features represented by the (*certain set of*) features in question, wherein said feature conversion step renders all the kinds of image features amounts each image to be searched and the inquiry image into the color distribution features
[Per the analysis of claim 21. Note that in claim 21 the kinds of features for the inquiry image and the images to be searched after conversion are the same (color distribution feature in this case).]
- A color distribution similarity calculation step of comparing the color distribution features of said inquiry image with the color distribution features of each said image to be searched and determining a similarity of each image to search for a similar image
[Per the analysis of claim 21]

The combined invention of Shiiyama and Matsuzaki does not expressly disclose that the certain set of features is the frequency distribution. However, Kusama teaches using frequency distribution features. [Co. 11, lines 52-56; Col. 12, lines 1-4.]

Shiiyama, Matsuzaki and Kusama are combinable because they have aspects that are from the same field of endeavor of image retrieval.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the combined invention of Shiiyama and Matsuzaki with the teachings of Kusama by accepting frequency distribution features for image retrieval. The motivation would have been to make the image search/retrieval method more flexible as well as to improve its efficiency (as discussed in the analysis of claim 21).

Therefore, it would have been obvious to combine Kusama with Shiiyama and Matsuzaki to obtain the invention as specified in claim 23.

17. Regarding claim 24 (and similarly claim 4), it is similarly analyzed and rejected as per the analyses of claims 22 and 23.

18. Regarding claim 31 (and similarly claims 11 and 41), it is an obvious variation of claim 23 (with the frequency features and color features reversed) and therefore is similarly analyzed and rejected.

19. Regarding claim 32 (and similarly claims 12 and 42), it is similarly analyzed and rejected as per the analyses of claims 22 and 31.

20. Claims 5-8, 25-28, 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiiyama (US 6,584,223), Matsuzaki et al. (US 6,804,683) and Kusama et al. (US 6,633,685) as applied to claims 3, 4, 11, 12, 23, 24, 31, 32, 36, 41 and 42 above, and further in view of Abe et al. (US 6,157,741).

21. Regarding claim 25, and similarly claims 5 and 37, the combined invention of Shiiyama, Matsuzaki and Kusama discloses

- a frequency distribution features conversion step of converting a frequency distribution features into a color distribution features indicative of feature similar to image features represented by the frequency distribution features in question
[Per the analysis of claim 23]

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- a color distribution similarity calculation step of comparing the color distribution features of said inquiry image with the color distribution features of each said image to be searched and determining a similarity of each image to search for a similar image
[Per the analysis of claim 23]
- said frequency distribution features conversion step renders all the kinds of image features amounts each image to be searched and the inquiry image into the color distribution features
[Per the analysis of claim 23]
- a color distribution features extraction step of extracting each pixel value of (said decoded) image as a color constituent features to extract a color distribution features indicative of feature similar to image features represented by said applied frequency distribution features
[Shiiyama: Fig. 4: refs. S13-S14; Col. 5, lines 1-64. Note that the label sequence referred to in Col. 5, lines 63-64 is the color distribution feature of the image]

The combined invention of Shiiyama, Matsuzaki and Kusama does not expressly disclose

- said frequency distribution features conversion step including an inverse-frequency transformation step of decoding an applied frequency distribution features to generate a decoded image

However, Abe discloses a method that applies an inverse-frequency transformation (IDCT in this case) to frequency distribution features (quantized, various-length encoded DCT coefficients), another kind of features is then extracted from the decoded image.
[See Fig. 1, refs. 4 and 5; Fig. 2, refs. 11 and 12; Col. 3, lines 39-42.]

The combined invention of Shiiyama, Matsuzaki and Kusama is combinable with Abe because they have aspects that are from the same field of feature extraction.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the combined invention of Shiiyama, Matsuzaki and Kusama with the

teachings of Abe by inversely DCT transforming frequency distribution features before feature extraction (e.g., extracting the kind of color distribution features of Shiiyama).

The motivation would have been because the kind of feature extraction such as Shiiyama's are performed on un-encoded images.

Therefore, it would have been obvious to combine Abe with Shiiyama, Matsuzaki and Kusama to obtain the invention as specified in claim 25.

22. Regarding claim 26 (and similarly claim 6), it is similarly analyzed and rejected as per the analyses of claims 22 and 25.

23. Regarding claim 27 (and similarly claims 7 and 38), it is similarly analyzed and rejected as per the analyses of claim 25. [In particular, note that Shiiyama teaches dividing an image into a plurality of (e.g., 9) blocks and then extracts color features of each block to form color distribution features of the image. (See Fig. 4, refs. S12-S14.)]

24. Regarding claim 28 (and similarly claim 8), it is similarly analyzed and rejected as per the analyses of claims 22 and 27.

25. Claims 9, 10, 18, 29, 30, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiiyama (US 6,584,223), Matsuzaki et al. (US 6,804,683), Kusama

et al. (US 6,633,685) and Abe et al. (US 6,157,741) as applied to claims 5-8, 25-28, 37-38 above, and further in view of Takata et al. (US 6,526,400).

26. Regarding claim 29 (and similarly claims 9, 10, 18, 30, 39 and 40), the combined invention of Shiiyama, Matsuzaki, Kusama and Abe discloses all limitations of its parent, claim 28. In particular, Shiiyama discloses representing each image block with a color label and use the color labels to form a label sequence (i.e., color distribution features). [See Col. 5, lines 50-64.]

The combined invention of Shiiyama, Matsuzaki, Kusama and Abe does not expressly disclose that the representative color label is actually a color.

However, Takata discloses a method that uses the average color of a block as its representative color. [See Fig. 15; Fig. 22, ref. S83; Col. 17, lines 18-25.]

Shiiyama, Matsuzaki, Kusama and Abe are combinable with Takata because they have aspects that are from the same field of feature extraction.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the combined invention of Shiiyama, Matsuzaki, Kusama and Abe with the teachings of Takata by using the average color of a block as its representative color.

The motivation would have been because the mean is a good and widely used representative of a population (e.g., colors in a block) and can be efficiently calculated.

Therefore, it would have been obvious to combine Abe with Shiiyama, Matsuzaki and Kusama to obtain the invention as specified in claim 29.

27. Claims 13, 33 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiiyama (US 6,584,223), Matsuzaki et al. (US 6,804,683), Kusama et al. (US 6,633,685), Abe et al. (US 6,157,741) and Takata et al. (US 6,526,400) as applied to claims 9, 10, 18, 29, 30, 39 and 40 above, and further in view of Cass et al. (US 6,141,441).

28. Regarding claim 33 (and similarly claims 13 and 43), the combined invention of Shiiyama, Matsuzaki, Kusama, Abe and Takata discloses all limitations of its parent, claim 31. In addition, Shiiyama and Takata teach/suggest representing each image block with a color (per the analysis of claim 29) and Kusama teaches using frequency distribution features [Co. 11, lines 52-56; Col. 12, lines 1-4].

The combined invention of Shiiyama, Matsuzaki, Kusama, Abe and Takata does not expressly disclose

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- an image generation step of generating an image which uses the representative color of each said block as a pixel, an image size change step of changing the size of the image generated by said image generation step to a predetermined size

However, Cass teaches a method that changes image size. [See Fig. 6; Col. 15, lines 19-31. Note that the set of representative color values, each representing a block (of an image that has been divided into $m \times n$ number of blocks), is considered as forming an $m \times n$ image whose pixel values are the representative color values.]

Shiiyama, Matsuzaki, Kusama, Abe and Takata are combinable with Cass because they have aspects that are from the same field of image processing.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the combined invention of Shiiyama, Matsuzaki, Kusama, Abe and Takata with the teachings of Cass by changing image size. The motivation would have been to ensure that similarity comparison of image features is made on the same basis, i.e., using features extracted from images of the same dimensions..

Therefore, it would have been obvious to combine Cass with Shiiyama, Matsuzaki, Kusama, Abe and Takata to obtain the invention as specified in claim 33.

Conclusion and Contact Information

29. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Y. Muto (JP 11-169568A) – Discloses a method for dividing an image into blocks, determining a representative color for each block and expanding data into blocks each having a representative color

30. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yubin Hung whose telephone number is (703) 305-1896. The examiner can normally be reached on 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Yubin Hung
Patent Examiner
October 26, 2004



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